

**SYSTEM AND METHOD FOR DELIVERING PROFILE
INFORMATION RELATING TO A CALLER**

1 FIELD OF THE INVENTION

2 This invention relates to telecommunication systems, and more particular to
3 facilities within telecommunications systems for delivering to a called party
4 information about a calling party.

5 BACKGROUND OF THE INVENTION

6 Telecommunications customers have widely accepted several services that
7 identify to a called subscriber certain limited information about the party or
8 telephone line from which the call originated. For example, for calls received on
9 conventional analog telephone lines, services available under the names "Calling
10 Line Identification (CLID)", "Calling Number Identification (CNID)", and "Caller ID"
11 identify the directory number of the telephone line or handset from which the call
12 was placed. A related "Caller ID with Name" service identifies the directory
13 number of the calling line or handset and a directory or billing name associated
14 with the calling line or subscriber.

15 In order to provide these services, the switching office terminating the call
16 transmits the identification information, in the form of voice-band Frequency-Shift
17 Keying (FSK) signaling over the subscriber loop, to customer-premise equipment
18 (CPE) which decodes the signals and displays the information. If the call originated
19 in another switching system, the called number information is generally available

20 to the terminating switching system from a signaling message used to set up the
21 call. If the call originated in the terminating switching system, the called number
22 information is generally available from a database in that switch. However,
23 information other than the calling number which is to be delivered to the called
24 subscriber must be requested by the terminating switch from an external database.
25 In conventional telecommunications networks providing circuit-switched voice
26 services, the transactions between the switch and the external database typically
27 employ the "Common Channel Signaling System No. 7" (CCS7) signaling protocol.
28 In networks employing the "Intelligent Network" model, the functional unit
29 providing the external database service (among other services) is referred to as a
30 Service Control Point (SCP).

31 Services are also available to provide limited caller identity information for
32 calls to Integrated Services Digital Network (ISDN) lines, for calls to lines served as
33 part of a group of business lines receiving a suite of business feature services
34 (sometimes sold by network operators under the mark "CENTREX"), and for calls to
35 private networks. These services and their underlying infrastructure are similar to
36 the conventional analog-line services mentioned above, although the
37 implementation details of delivery of the information to the called station or other
38 display equipment, and mechanisms by which information is requested from a
39 database, may vary.

40 Although the conventional caller identification services have achieved wide
41 acceptance among service providers and telecommunications end users, the

services in their current form have several limitations which restrict their utility. First, the services deliver limited quantities of information. Existing systems for delivering caller identification information have limited available capacity, and conventional display devices are adapted to display only limited amounts of information. Some services deliver only the directory number of the calling line. Other services also deliver a subscriber name associated with the calling line. This information may be useful, but additional information regarding the caller would be valuable in many cases, particularly to customers in large organizations who may frequently make and receive calls to and from callers with whom they are not acquainted.

Another limitation is that the services deliver the identity of the line or subscription from which a call is placed, rather than the identity of the caller. If the call is placed from a PBX or a line of a CENTREX group, conventional caller identification services typically provide the identity of the business or other subscriber organization, rather than the individual caller. Similarly, if a caller uses the telephone line or handset of another, e.g. when travelling, conventional caller identification services identify the premises from which the call is placed, or the owner of the handset, rather than the individual caller.

A further limitation, particularly from the caller's perspective, is that the same type of information, and the same information content, is delivered for each call. A caller may wish to provide (or omit to provide) different information depending on the purpose of a call. For example, a caller making a personal call

from a business may not desire that the business be identified. Existing caller identification services usually allow a caller to block completely the delivery of their identifying information on a per-call basis, but do not allow the caller to elect to deliver some but not all information. In addition, the information delivered with a call is controlled and maintained by the telecommunications service provider, and generally cannot be edited or amplified by the caller.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a system and methods for delivering enhanced caller identification services that minimize the disadvantages of the prior art.

In a preferred embodiment constructed according to the present invention, a Caller Profile system and service are provided by which a caller may establish a caller profile which is to be selectably delivered to called parties contemporaneous with the delivery of a call. The caller profile may optionally be delivered at another time upon the caller's request. The caller profile may include text information, images, sound, or other multimedia content. The caller profile information may be stored in a database operated by a service provider, but may also be stored in a corporate or user-operated database. However stored, the caller profile may be created and revised by the user, as needed, using a network terminal, such as a computer-based World Wide Web browsing system, or an interactive voice response system. Prior to making a call, the caller may select one of several profiles to be delivered with subsequent calls. When using a

telecommunications service other than a service to which the caller normally subscribes--such as when making calls while traveling, visiting another office, or borrowing another subscriber's handset--the caller may request that the caller's own profile be delivered, rather than caller identification or profile information corresponding to the "borrowed" line, subscription, or handset.

In a first preferred embodiment constructed according to the present invention, and adapted for use in a circuit-based telecommunications network including Intelligent Network (IN) components, the Caller Profile Database Server (CPDS) function is performed by an IN Service Control Point (SCP). As is known, the SCP is connected to switching systems and other nodes having call processing functions using the CCS7 network. A Caller Profile Administrative Server (CPAS) is connected to the SCP and has connections to external networks, such as the Internet. The CPAS provides a user interface to enable subscribers to create and edit profiles, and select them for use. Updated profiles and selections are transferred to the CPDS/SCP, which stored the profiles and delivers them pursuant to requests from switches. An Interactive Voice Response (IVR) system is connected to the SCP and the telecommunications network and allows the caller to remotely enable caller profile delivery for calls made from a line, terminal, or handset other than those to which the caller subscribers.

In a second preferred embodiment constructed according to the present invention, and adapted for use in a packet-based telecommunications network, the CPDS function is performed by a network database server. Gateway/Feature

108 servers provide functions equivalent to those of switching systems of circuit
109 networks. The CPAS is connected to the CPDS and to a user-accessible network to
110 enable subscribers to create and edit profiles, and select them for use, and to allow
111 updated profiles and selections to be transferred to the CPDS. The IVR is
112 connected to the CPDS and the telecommunications network and allows the caller
113 to remotely enable caller profile delivery for calls made from a line, terminal, or
114 handset other than those to which the caller subscribes.

115 **BRIEF DESCRIPTION OF THE DRAWINGS**

116 These and other features of the invention will be best understood by
117 reference to the following detailed description of a preferred embodiment of the
118 invention, taken in conjunction with the accompanying drawings, in which:

119 Fig. 1 is a block diagram of a first preferred embodiment 100 of a caller
120 profile system constructed in accord with the present invention and arranged for
121 use with a circuit-based telecommunications system;

122 Fig. 2 is a block diagram of a second preferred embodiment 200 of a caller
123 profile system constructed in accord with the present invention and arranged for
124 use with a packet-based telecommunications system;

125 Fig. 3 is a block diagram showing a method for use with the preferred
126 embodiments 100, 200 of Figs. 1-2 for creating, storing, and activating a caller
127 profile for a subscriber;

128 Fig. 4 is a block diagram showing a method for use with the preferred
129 embodiments 100, 200 of Figs. 1-2 for delivering caller profile information to a
130 called party when the caller is using a line, service, or handset to which the caller
131 subscribes;

132 Fig. 5 is a block diagram showing a method for use with the preferred
133 embodiments 100, 200 of Figs. 1-2 for delivering caller profile information to a
134 called party when the caller is using a line, service, or handset to which the caller
135 does not subscribe; and

136 Fig. 6 is a block diagram showing a method for use with the preferred
137 embodiments 100, 200 of Figs. 1-2 for activating the caller profile service in a
138 remote mode to enable delivery of caller profile information to a called party
139 when the caller is using a line, service, or handset to which the caller does not
140 subscribe.

141 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

142 Fig. 1 is a block diagram of a first embodiment 100 of a caller profile system
143 constructed in accord with the present invention and arranged for use with a
144 circuit-based telecommunications system.

145 A telecommunications system constructed according to an aspect of the
146 present invention may, in various embodiments, provide communications bearing
147 voice signals, data, video, and any other content. Hereinafter, the term "call" is
148 used herein to refer a session of information transfer between a set of subscriber

terminals (or other endpoints) via a telecommunications system or network. The term "call" is intended to refer broadly to any type of call, service, connection, session, packet, or datagram, or any related group or stream thereof, regardless of media or content, and regardless of whether or not the communication is circuit, connection, or session oriented. Thus, the term "call" is intended to include, but not be limited to traditional circuit voice calls, packet voice calls, circuit data calls, connectionless calls, or packet data calls, and multimedia variants thereof.

The term "circuit" as applied to a call, network, or system refers to a mode of information transfer which occurs between defined endpoints over reserved network resources, and in which units of data are not individually addressed. Once a path or route is established for a circuit call, no further routing or addressing is required. It is recognized that some components carrying a circuit call may be implemented using packet- or cell-based technologies. The term "packet" as applied to a call, network, or system refers to a mode of information transfer in which a stream of information is divided into packets or units, and in which each packet or unit is individually addressed. A packet call does not necessarily reserve network resources.

The present application relates to telecommunications systems. It will be appreciated that in the telecommunications arts, various signal leads, busses, data paths, data structures, channels, buffers, and other communications paths may be used to implement a facility, structure, or method for conveying information or signals, and are often functionally equivalent. Accordingly, unless otherwise

171 noted, references to apparatus or data structures for conveying a signal or
172 information are intended to refer generally to all functionally equivalent
173 apparatus and data structures.

174 As best seen in Fig. 1, the first embodiment 100 includes a calling subscriber
175 terminal 120 coupled via a suitable line 150 to an originating switching system 118.
176 Originating switching system 118 is connected via suitable trunks or carrier facilities
177 152 to a telecommunications network 116, such as the Public Switched
178 Telecommunications Network (PSTN). A terminating switching system 122 is
179 connected to network 116 via suitable trunks or carrier facilities 154. Terminating
180 switch 122 is connected via a suitable line 156 to a called subscriber terminal 124.
181 As is known in the art, switch 118, NETWORK 116, and switch 122 may cooperate
182 to complete calls to and from the terminals 120 and 124. Although network 116 is
183 shown and described herein as a public switched network, the general architecture
184 of the first embodiment 100 is similarly applicable to private telecommunications
185 networks.

186 Subscriber terminals 120 and 124 may be any suitable terminals adapted for
187 use with switching systems 118 and 122, and with lines 150 and 156, respectively.
188 For example, terminals 120 and 124 may be ordinary analog telephone sets, ISDN
189 telephones, IP telephones, wireless handsets, telephony-enabled personal
190 computers, and the like, with facilities to display a caller profile. The display
191 facilities may be integrated with the terminals 120 and 124, or may be
192 implemented as a separate caller profile display unit (not shown), which may be

193 similar to existing Caller ID display units. Because caller profile information may be
194 voluminous and include media other than text, a caller profile display unit may be
195 equipped with display screen having greater capacity, improved resolution, and the
196 capability to display images and present audio or other media. Many personal
197 computers, electronic organizers, and similar devices have these capabilities and, if
198 the computer or other device is not already telephony-enabled, it could be used as
199 a display with a suitable connection to a telephone or other subscriber terminal.
200 For example, many ISDN telephones have a data interface port which may be
201 connected to a computer. Some display devices, such as personal computers, may
202 be capable of displaying several caller profiles simultaneously, which may be
203 advantageous during conference calls.

204 Lines 150 and 156 are intended to represent a compatible connection
205 between terminals 120, 124 and switches 118, 122 without regard to the physical
206 media or infrastructure used to implement the connection. Thus, lines 150 and 156
207 may be, for example, analog telephone lines, ISDN lines, appropriate resources of a
208 wireless telecommunications system, and the like. In this instance, the term "line"
209 is used with a meaning more expansive than that ordinarily applied in the
210 telecommunications arts.

211 Switching systems 118 and 122 may be any suitable telephone switching
212 systems. For example switching systems 118 and 122 may be distributed stored-
213 program-controlled digital switches, such as the 5ESS[®] switching system, a product
214 of Lucent Technologies Inc., 600 Mountain Avenue, Murray Hill, New Jersey,

215 07974-0636, and described in the AT&T Technical Journal, vol. 64, number 6,
216 July/Aug. 1985, pages 1303-1564. Switches 118 and 122 may also be a distributed,
217 stored-program-controlled, integrated services digital network (ISDN) electronic
218 switching system such as the system disclosed in U. S. patent number 4,592,048,
219 issued to M. W. Beckner, et al., on May 27, 1986. Other switching system
220 implementations could also be used.

221 A Service Control Point (SCP) 110 is preferably connected to switch 118 via a
222 link 158 and switch 122 via a link 160. The SCP 110, switches 118 and 122, links 158
223 and 160, form parts of an Intelligent Network, which may of the type described in
224 AT&T Technical Journal, Summer, 1991, pp. 11-25, or similar thereto. The
225 Intelligent Network architecture provides a cooperative, distributed network
226 platform for delivering advanced telecommunications services. Links 158 and 160
227 are preferably CCS7 links, but other signaling or data links could also be used.
228 Although links 158 and 160 are depicted as point-to-point links, they may also be
229 implemented as connections through a packet-switched signaling network, as is
230 known and practiced in the art.

231 SCP 110 provides database storage and retrieval functions to other network
232 elements. In addition, SCP 110 also implements advanced services, by executing
233 service logic programs in response to triggers and requests from other network
234 elements, and by issuing instructions to other network elements. The other
235 network elements may include switching systems and Service Nodes (SN), which can

236 provide a variety of voice and signal processing services, and user interaction
237 services, and service-circuit features.

238 In the first preferred embodiment 100, SCP 110 is used to maintain a
239 database of caller profiles, and to deliver caller profiles to switches or other
240 network elements for display to a called party, in conjunction with appropriate
241 service logic, and in that role is referred to as the Caller Profile Database Server SCP
242 (CPDS/SCP). Any suitable IN SCP may be used to implement CPDS/SCP 100. For
243 example, CPDS/SCP 100 may be implemented using the Lucent Technologies Service
244 Control Point, which is commercially available from Lucent Technologies Inc., 600
245 Mountain Avenue, Murray Hill, New Jersey, 07974-0636, or using the Enhanced
246 Control Server (eCS), which is also commercially available from Lucent
247 Technologies. Other SCP products could also be used.

248 The switching system 122 serving the called party is responsible, when calls
249 arrive for a served called party, for: (1) determining whether the called party
250 subscribes to the Caller-ID or Caller Profile services; (2) determining whether a
251 caller profile is available and active for the calling party; (3) determining the
252 capabilities of the customer-premise equipment (CPE), such as subscriber terminal
253 124 and the associated caller profile display facilities; (4) obtaining caller profile
254 information from CPDS/SCP 110; and (4) delivering the caller profile information in
255 an appropriate manner for the CPE. When a call arrives from a calling party for
256 which a caller profile is available and active, an Intelligent Network trigger is
257 activated within switching system 122, and the switching system launches a query

258 to CPDS/SCP 110. The CPDS/SCP 110 returns appropriate caller profile information
259 to the switch 122, which then delivers it to the called party user terminal 124. If
260 high service demand occurs, links 158 and 160 between CPDS/SCP 110 and switches
261 118, 122 may be saturated by the large amount of information that may be
262 contained in a caller profile. Accordingly, it may be desirable to use high-speed
263 TCP/IP links for this traffic to avoid degrading the performance of the CCS7
264 network.

265 If the called subscriber terminal has limited display capability, switch 122
266 preferably transmits an abbreviated version of the caller profile, for example, by
267 omitting images and other media, or by sending only predefined fields, selection
268 of which may be controlled by system-wide defaults or by the caller profile
269 subscriber.

270 Moreover, switch 122 preferably transmits the caller profile in a format and
271 using a physical media path appropriate for the subscriber terminal and display.
272 For example, for analog telephones, limited caller profile information may be
273 transmitted using voice-band FSK over subscriber loop, as is now done for the
274 Caller ID service. For ISDN telephones, more extensive caller profile information
275 may be transmitted using any of several mechanisms: by transmitting the
276 information in Q.931-style signaling messages over the D-channel; by transmitting
277 the information using an X.25 packet-switched data path over the D-channel; or by
278 placing a data call over the B- or D- channels. The information may be displayed
279 on the ISDN telephone or on an associated display device. Although the Q.931

280 protocol, as currently standardized, may not support transport of the additional
281 information contained in a caller profile, but one of skill in the art will understand
282 how the protocol may be easily extended to support such additional information.
283 For wireless handsets, caller profile information may be transmitted using existing
284 messaging protocols, such as the Short Message Service, or using a data connection
285 to the handset similar to that used to provide World-Wide Web browsing and
286 other data services to wireless handsets.

287 For other devices, such as computers, the switch 122 may transmit caller
288 profile data via a TCP/IP link or another appropriate higher capacity link. In some
289 applications, particularly where caller profiles are extensive, and subscriber
290 terminals are capable of displaying such extensive information, it may be
291 preferable for the switch 122 to deliver only a pointer or locator for the actual
292 caller profile information. In that case, the actual caller profile information may be
293 stored on and delivered by a server separate from CPDS/SCP 110.

294 For example, switch 122 may deliver to appropriate terminals a URL (or other
295 pointer or locator) which locates a subscriber's caller profile information stored on
296 any web server accessible to the called party. Thus, the URL would be stored on
297 the CPDS/SCP 110, while the caller profile information could be stored on a web
298 server operated by the telecommunications service provider (on the Internet or on
299 a private network) such as CPAS 112, or on a web server operated by another
300 provider or the caller. Subscriber terminal 124 is preferably adapted to fetch and
301 display the caller profile web page at the URL supplied by switch 122, either

302 automatically or upon the request or permission of the terminal user. The service
303 of providing different caller profile information depending on the called party, the
304 time of day, or other distinguishing factors, could still be provided through
305 CPDS/SCP 110 by delivering one of a set of different available caller profile URLs
306 selected, e.g., according to rules established by the caller profile subscriber. Also,
307 CPDS/SCP 110 and/or switch 122 may select for delivery an appropriate one of
308 several available URLs depending upon the display capabilities of the subscriber
309 terminal 124 or associated display unit.

310 As an alternative to delivering a URL, CPDS/SCP 110 could store the URL, and,
311 each time caller profile information is required, fetch the referenced Caller Profile
312 information and transmit it to switch 122 for delivery to the subscriber terminal.
313 Optionally, CPDS/SCP 110 and/or switch 122 may translate the retrieved caller
314 profile information from its stored representation into a form suitable for the
315 display capabilities of the subscriber terminal 124 or associated display unit. For
316 example, if the Caller Profile information is stored in HTML, and the subscriber
317 terminal 124 is a wireless handset having a WAP- or HDML-compatible browser, the
318 Caller Profile information may be translated into the appropriate WAP or HDML
319 form before delivery to the handset.

320 In systems that rely on a URL or a similar pointer to identify the location of
321 caller profile information which is stored in a standardized format (such as a World
322 Wide Web page) and which may be administered and edited using ubiquitous

323 tools, the caller profile subscriber may directly create and maintain the caller
324 profile information.

325 As best seen in Fig. 1, a Caller Profile Administrative Server (CPAS) 112 is
326 connected to CPDS/SCP 110 via link 168, and to a data-capable network 126, such
327 as the Internet, via link 170. The CPAS 112 allows subscribers to create and edit
328 their caller profiles, and to select rules for delivery of their profile to called parties.
329 CPAS 112 preferably provides at least a remotely-accessible user interface by which
330 subscribers may interact with the caller profile service. For example, CPAS may
331 provide an interface in the form of a collection of World-Wide Web pages which
332 subscribers may access using a web-browser-equipped computer 128 via link 172
333 and network 126.

334 During a user-accessed caller profile editing session, CPAS 112 may pass each
335 profile creation, editing, and selecting transaction directly to CPDS/SCP 110 for
336 immediate updating of the caller profile database. Alternatively, CPAS 112 may
337 create a local copy of the caller profile records for the subscriber, locally perform
338 the creation, editing, and selection transactions requested, and transmit the
339 revised records to CPDS/SCP to replace the obsolete data. Links 170 and 172 may
340 be any suitable data links, such as TCP/IP links. Other data links could also be used.
341 Link 168 may be any suitable data link with which CPAS 112 and CPDS/SCP 110 are
342 compatible. For example, link 168 may be a TCP/IP link or a CCS7 link.

343 As best seen in Fig. 1, an Interactive Voice Response (IVR) system 114 is
344 preferably connected to SCP 110 via link 162 and to NETWORK 116 via link 164.

345 According to an aspect of the invention, the IVR system 114 allows a caller profile
346 subscriber to remotely control the selection and delivery of his or her profile, both
347 from the subscriber's normal line, service, or handset, and from a "borrowed" line,
348 service, or handset. Among other functions, the IVR system 114 preferably allows
349 the subscriber to request that the subscriber's profile be delivered with the next
350 call made from a "borrowed" line, service, or handset.

351 IVR system 114 receives calls from NETWORK 116 and implements a voice-
352 based dialog with a user to allow the user to request information, and to edit and
353 select profiles for use. IVR system 114 preferably includes facilities, under control
354 of predefined programs or scripts, to play speech messages and prompts to the
355 user, and to receive input from the user in the form of speech and/or dialed digits.
356 Responsive to user input, the IVR system 114 may update a locally stored database,
357 or may generate database update transactions to be transmitted to SCP 110. IVR
358 system 114 may be implemented using any suitable commercially available
359 interactive voice response system. For example, the CONVERSANT Interactive Voice
360 Response System, which is commercially available from Lucent Technologies Inc.,
361 600 Mountain Avenue, Murray Hill, New Jersey, 07974-0636, may be used. Other
362 voice response systems could also be used.

363 IVR system 114 could also be implemented using an intelligent network
364 Service Node (SN), in conjunction with CPDS/SCP 110. A SN may provide voice
365 prompt, digit collection, voice recognition, and other signal processing services,
366 under control of an SCP. The logic, script, or program required to implement the

367 desired user interface may be locally executed in the SN, or the SN may be used to
368 provide individual voice processing services under the close direction of the
369 CPDS/SCP. If IVR system 114 is implemented using a SN, any suitable commercially
370 available SN product may be employed. For example, IVR system 114 may be
371 implemented using one of the Intelligent Network service node products available
372 from Lucent Technologies Inc. under the designations Lucent Technologies Service
373 Node/Intelligent Peripheral or Lucent Technologies Compact Service
374 Node/Intelligent Peripheral. Other SN products could also be used.

375 IVR system 114 receives calls from NETWORK 116 via link 164, which may be
376 implemented using any suitable line, or trunk facility. Commercially-available IVR
377 systems can typically support several simultaneous users. Accordingly, link 164 may
378 be a trunk facility capable of supporting a plurality of voice paths, such as an ISDN
379 Primary Rate Interface trunk facility. Commercially-available IVR systems may also
380 support several simultaneous applications. Thus IVR system 114 may also be used
381 to support other network applications in addition to supporting the function of
382 remote subscriber access to caller profiles. Link 162, connecting the IVR system 114
383 to CPDS/SCP 110, may be any suitable data link with which both devices are
384 compatible. For example, link 162 could be a TCP/IP link, or a CCS7 link.

385 In implementations where caller profile service is to be provided to a
386 network employing subscriber terminals having advanced capabilities, the IVR 114
387 may be omitted, and the user interactions needed to administer a subscriber's
388 caller profiles may be performed using the user-interface features of the terminals.

For example, in a network of ISDN telephones having "soft keys" (keys or buttons which are not permanently bound to a specific terminal function), display message may be used to prompt the user to select options, an the like, using the telephone key pad and soft keys. The advanced subscriber terminal may also be used for interactions with CPAS 112, eliminating the need for the web-browser-equipped computer 128.

Fig. 2 is a block diagram of a second preferred embodiment 200 of a caller profile system constructed in accord with the present invention and arranged for use with a packet-based telecommunications system. The second embodiment 200 may be arranged in a manner generally similar to the first embodiment 100, with some modifications including the replacement of conventional circuit-switched network elements with other elements adapted to provide service in a packet network environment. Unless otherwise specified, a component of Fig. 2 may be considered to perform functions of identified corresponding components of Fig. 1.

As best seen in Fig. 2, the second preferred embodiment 200 of a caller profile system constructed in accord with the present invention comprises an originating Gatekeeper/Feature Server/Gateway system (GFSG) 218 and a terminating Gatekeeper/Feature Server/Gateway system (GFSG) 222. Originating GFSG 218 and terminating GFSG 222 may provide functions in packet networks similar to the functions of switching systems in circuit networks, including call authorization, call set-up, call teardown, call feature implementation, operations and maintenance, and interfaces to core networks, access networks, transmission

411 networks and other networks. The "gateway" function refers to the conversion of
412 elements of a telecommunications service from a first media, encoding type,
413 signaling, or switching and transport technology (e.g., circuit, cell, or packet), to
414 another. Heterogeneous networks employing uniform media, encoding type,
415 signaling, and switching and transport technologies throughout may not require
416 the gateway function.

417 A calling party subscriber terminal 220 is preferably connected via link 250 to
418 the originating GFSG 218. The originating GFSG 218 is connected via a link 252 to
419 a network 216, which may be a public packet network such as the Internet.
420 Network 216 could also be a private packet network. Unless otherwise specified,
421 all links shown in Fig. 2 may be implemented using any suitable packet- or cell-
422 based networking technology, including TCP/IP, ATM, HDLC, and the like, and may
423 be carried over any suitable media. It will be appreciated by one of skill in the art
424 that networks or links characterized as "packet" based may incorporate circuit-
425 based transmission and/or switching facilities. The terminating GFSG 222 is
426 connected to network 216 via link 254. A called subscriber terminal 224 is
427 connected to terminating GFSG 222 via link 256. Subscriber terminals 220 and 224
428 may be any suitable packet-telephony-enabled terminal, such as an IP telephone
429 set or a personal computer with IP telephone software.

430 GFSG 218 and GFSG 222 may be implemented using any appropriate
431 Gatekeeper, Feature Server, and Gateway elements, which may be realized as an
432 integrated element, as individual elements, or any combination thereof. For

433 example, GFSG 218 and GFSG 222 could be implemented using one of the
434 telecommunications service delivery platforms which are commercially available
435 from Lucent Technologies Inc., under the designations 5ESS® switching system or
436 7R/E Packet Solutions platform, in conjunction with an appropriate gateway
437 element, such as one commercially available from AG Communication Systems,
438 2500 W. Utopia Road, Phoenix, AZ 85027-4129, under the designation AGCS
439 iMerge Centrex Feature Gateway.

440 A Caller Profile Database Server (CPDS) 210 is connected to GFSG 218 via link
441 258, GFSG 222 via link 280, a Caller Profile Administrative Server (CPDS) 212 via link
442 268, and network 216 via link 282. The CPDS 210 provides functions similar to
443 those of the CPDS/SCP 110 of the first embodiment 100. Terminating GFSG 222
444 preferably includes a trigger facility which is activated when a call arrives at the
445 terminating GFSG from a calling party for which a caller profile is available and
446 active. In response to the activated trigger, the GFSG launches a query to CPDS 210
447 for the caller profile information. The CPDS 210 returns the caller profile
448 information to the terminating GFSG 222, which delivers it for display to subscriber
449 terminal 224, or to a separate display device (not shown). Most subscriber
450 terminals capable of use in packet networks are equipped with versatile displays
451 that may advantageously used to display caller profile information. Accordingly, in
452 most cases, a separate caller profile display will not be required. Any suitable
453 server computer having database capabilities may be used to implement CPDS 210.
454 For example, CPDS 210 may be implemented using one of an Intelligent Network

455 switching control point product available from Lucent Technologies Inc. under the
456 designation Lucent Technologies Switching Control Point. Other SCP products
457 could also be used, as could commercially available database server computers
458 equipped with appropriate network interfaces.

459 CPAS 212 provides functions similar to those provided by CPAS 112. CPAS
460 212 is preferably connected to network 216 via link 270, and CPDS 210 via link 268.
461 CPAS 212 provides a subscriber-accessible interface for creating, editing, and
462 selecting the subscriber's caller profiles. CPAS 212 may provide a World-Wide Web
463 interface, or any other suitable user interface. Likewise, CPAS 212 may be accessed
464 by any suitable computer or terminal device compatible with the user interface.
465 During a user-accessed caller profile editing session, CPAS 212 may pass each
466 profile creation, editing, and selecting transaction directly to CPDS 210 for
467 immediate updating of the caller profile database. Alternatively, CPAS 212 may
468 create a local copy of the caller profile records for the subscriber, locally perform
469 the creation, editing, and selection transactions requested , and transmit the
470 revised records to the CPDS 210 to replace the obsolete data. Any suitable server
471 computer having database capabilities may be used to implement CPAS 212. For
472 example, CPAS 212 may be implemented using one of the Intelligent Network
473 service node products available from Lucent Technologies Inc. under the
474 designations Lucent Technologies Service Node/Intelligent Peripheral or Lucent
475 Technologies Compact Service Node/Intelligent Peripheral. However, other service
476 node products, and other server/database computers, could also be used. As a non-

477 limiting example, in an embodiment in which network 216 is a public data
478 network, and subscriber terminals 220 and 224 are implemented using equipment
479 having database capabilities, as could be the case with PC-based packet
480 telephones, the functions of CPDS 210 and CPAS 212 may be integrated as a part of
481 the subscriber terminals. The calling subscriber terminals would deliver caller
482 profile information to respectively attached GFSGs, which would forward the caller
483 profile information to the called subscriber terminal or to the GFSG serving the
484 called subscriber terminal. In such an embodiment, all of the CPAS and CPDS
485 functions may be distributed among the subscriber terminals, and thus there may
486 be no centralized equipment to provide the CPDS and CPAS functions. As an
487 alternative, suitably equipped subscriber terminals could provide CPDS and CPAS
488 functions, while centralized CPDS and CPAS equipment would provide those
489 functions for subscriber terminals lacking those capabilities.

490 As best seen in Fig. 2, an Interactive Voice Response (IVR) system 214 is
491 preferably connected to CPDS 210 via link 262 and to network 216 via link 264.
492 The IVR 214 provides functions similar to those of IVR 114 of first embodiment 110.
493 According to an aspect of the invention, the IVR system 214 allows a caller profile
494 subscriber to remotely control the selection and delivery of his or her profile, both
495 from the subscriber's normal line, service, or handset, and from a "borrowed" line,
496 service, or handset. IVR system 214 receives calls from network 216 via link 264.
497 Among other functions, the IVR system 214 preferably allows the subscriber to
498 request that the subscriber's profile be delivered with the next call made from a

499 "borrowed" line, service, or handset. IVR system 214 receives calls from NETWORK
500 216 and implements a voice-based dialog with a user to allow the user to request
501 information, and to edit and select profiles for use. Link 262 connects the IVR
502 system 214 to CPDS 210, enabling the CPDS 210 database to reflect changes
503 requested by caller profile subscribers.

504 IVR system 214 may be implemented using any suitable commercially
505 available interactive voice response system. For example, the CONVERSANT
506 Interactive Voice Response System, which is commercially available from Lucent
507 Technologies Inc., 600 Mountain Avenue, Murray Hill, New Jersey, 07974-0636, may
508 be used. Other voice response systems could also be used, including an intelligent
509 network Service Node (SN), in conjunction with CPDS 210, or a general-purpose
510 server computer having installed therein suitable voice processing software.

511 In implementations where caller profile service is to be provided to a
512 network employing subscriber terminals having advanced capabilities, the IVR 214
513 may be omitted, and the user interactions needed to administer a subscriber's
514 caller profiles may be performed using the user-interface features of the terminals.

515 As shown in Figs. 1 and 2, switch 118 and GFSG 218, and called or
516 terminating switch 122 and GFSG 222 all occupy the positions of
517 telecommunications switching systems in currently envisioned network
518 architectures. However, for the purposes of embodiments 100, 200 of a caller
519 profile system constructed according to the present invention, it is the call
520 origination, call termination, and call feature server functions of these elements

521 that are of greatest interest. Future network architectures may decouple these
522 functions from other traditional telecommunications switching functions.
523 Accordingly, elements 118, 122, 218, and 222 may be referred to herein
524 alternatively as telecommunications switching systems or call processor elements,
525 whether or not they actually contain or directly control a switching or routing
526 fabric.

527 Although first and second embodiments 100 and 200 are described in terms
528 of circuit and packet paradigms, respectively, one of skill in the art will appreciate
529 that commercial networks may be constructed in a hybrid fashion, incorporating
530 elements of each paradigm with appropriate gateways or interworking facilities to
531 enable these elements to work together compatibly. Moreover, networks may be
532 constructed as overlays of one technology over the other, and such overlaid
533 systems may actually be implemented using elements and components in common.
534 Thus, as implemented in practice, a single component or element may perform
535 selected functions of embodiments 100, 200, and multiple components, elements,
536 and functions may be integrated into a single unit. By way of example, but not
537 limitation, a single SCP could serve as both the CPDS/SCP 110 of a circuit network
538 and the CPDS 210 of a packet network. For another example, although CPDS 210
539 and CPAS 212 are shown and described as distinct elements, they could be
540 implemented as multiple functions of a single server computer, or the like.

541 Fig. 3 is a block diagram showing a method for use with the preferred
542 embodiments 100, 200 of Figs. 1-2 for creating, storing, and activating a caller

543 profile for a subscriber. The method is useable after the subscriber has arranged
544 for the service with the service provider, and any service provider business-office
545 and provisioning steps have been completed. In current practice, features to be
546 provided by switches 118, 122, and GFSGs 218, 222, including the call triggers or
547 equivalent mechanisms used to invoke the specialized call processing associated
548 with the Caller Profile service, are activated on a subscriber's line through "recent
549 change" commands or equivalent means of modifying subscriber related data. The
550 commands may be directly entered by a craftsperson at a control terminal of the
551 switch 118, 122 or GFSG 218, 222, but are often supplied instead via a remote
552 administration data link from a service order processing and provisioning system of
553 a service provider. A similar remote administration data link may be provided to
554 the CPAS 112, 212. When a subscriber requests a new service, the service provider's
555 business-office personnel would enter a service order into the service order
556 processing system. The service order processing system examines the type of
557 service being requested and the subscriber's location and responsively issues
558 updates to the CPAS to establish an account for the subscriber. In addition the
559 service order processing system would determine which switch or GFSG serves the
560 subscriber and it would generate the recent change commands that are used by
561 the switch to update the service profile stored in the switch or GFSG for that
562 subscriber's line. The service profile identifies which features and triggers are
563 active for the subscriber's line. An Intelligent Network "Dialed Number" trigger,

564 which is invoked on the completion of dialing, is preferably activated for the
565 subscriber's line, in order to provide the Caller Profile service.

566 The method starts in step 310, in which the subscriber logs into the CPAS
567 112, 212, and establishes a user identification code and password. Alternatively, a
568 user identification code and/or password may be assigned to the user by the service
569 provider, and such assignment may occur as an automatic step in the service
570 provisioning process. If a user identification code and password have already been
571 assigned, the subscriber need only log in or otherwise authentically establish the
572 subscriber's identity to the CPAS 112, 212. If the subscriber accesses the CPAS 112,
573 212 using a subscriber terminal from which subscriber identity can reliably be
574 determined, such as certain types of wireless handsets, the CPAS 112, 212 may
575 optionally accept the opening of a connection or session to the CPAS without
576 requiring further authentication.

577 The CPAS 112, 212, preferably provides an externally accessible interface for
578 use by the subscriber in logging in, establishing the user identification and
579 password, and for other interactions needed to administer the subscriber's caller
580 profiles. For example, the interface may be presented as a hyperlinked collection
581 of World Wide Web pages which the subscriber may access using a web-browser-
582 equipped computer 128 via link 172 and network 126 (Fig. 1), or using a data-
583 capable subscriber terminal, such as 220 or 224 (Fig. 2). Other interfaces could also
584 be used. For example, CPAS 112, 212 could provide an alternate interface via IVR
585 system 114 or 214, which the subscriber may access using any subscriber terminal.

586 In step 312, the user enters one or more caller profiles which may be
587 delivered to other subscriber. The CPAS may prompt the user for caller profile
588 information according to a script or template. The CPAS may also accept free-form
589 caller profile information, and/or URLs or other pointers or locators specifying one
590 or more locations from which the caller profile information is to be retrieved.
591 According to an aspect of the present invention, the user may also specify policy
592 options or rules defining conditions under which caller profiles will be transmitted,
593 depending on the time of day, a classification of the called party or called number,
594 or other characteristics. By way of example, but not limitation, the user may
595 specify that a first profile be transmitted when calling a number within the
596 subscriber's company or organization, and a second profile (or no profile) be
597 transmitted when calling an outside number. By way of another example, the user
598 may specify that an abbreviated profile be transmitted when calling a number in
599 the subscriber's personal directly or speed-dial list, and a full profile be transmitted
600 when calling other numbers. Other distinguishing characteristics could also be
601 used. Further, in this step, the subscriber may specify that upon the origination of
602 certain calls, the subscriber is to be prompted to select the caller profile to be
603 delivered to called party. The rules determining for which calls the subscriber will
604 be prompted may depend on various characteristics of the time of day, called
605 party, called number, and the like.

606 Once the user completes the task of administering Caller Profiles, the
607 method continues in step 314, in which the CPAS 112, 212 loads the subscriber'

608 profile information into CPDS/SCP 110 or CPDS 210. The profile information may
609 include both data, representing the caller profiles themselves, and instructions,
610 such as service logic steps, which may be used to implement the subscriber's chosen
611 policy options or rules governing selective delivery of the subscriber's profiles. In
612 step 316, which is optional, the CPAS 112, 212 may inform switch 122 or GFSG 222
613 that a caller profile has been established for the for the subscriber's line,
614 subscription, or handset. This information may be used by the switch 122 or GFSG
615 222 to activate the "Dialed Number" Intelligent Network trigger for the line, or
616 and equivalent mechanism, in the switch, which is invoked when the subscriber
617 later originates a call. However, the activation may also occur at an earlier stage at
618 the time the Caller Profile service is provisioned. The method ends at step 318.

619 Fig. 4 is a block diagram showing a method 400 for use with the preferred
620 embodiments 100, 200 of Figs. 1-2 for delivering caller profile information to a
621 called party when the caller is using a line, service, or handset to which the caller
622 subscribes. The method begins in step 410, in which the Caller Profile service
623 subscriber originates a call, e.g., by dialing a called number, or by taking such other
624 action as would be appropriate for the subscriber terminals and network in use. In
625 step 412, the switch 118 or GFSG 218 determines whether the calling party (i.e., the
626 subscriber) subscribes to the Caller Profile service. If the calling party does
627 subscribe, the method continues in step 414. If the calling party does not
628 subscribe, the method continues in step 440, in which subsequent handling of the
629 call follows normal call processing procedures. The determination of step 412 may

630 occur via an Intelligent Network "Dialed Number" trigger, which "fires" or is
631 invoked when the subscriber has completed dialing a number.

632 In step 414, the switch 118 or GFSG 218 launches a query to CPDS/SCP 110 or
633 CPDS 210 for information regarding Caller Profile Service options governing the
634 subscriber's caller profile. The query preferably includes the dialed number, so that
635 the CPDS/SCP 110 or CPDS 210 may use that information to select for delivery, or
636 offer for such selection, different caller profile information based on the dialed
637 number (or possibly other factors). In step 416, the CPDS/SCP 110 or CPDS 210
638 returns the Caller Profile Service options. In step 416, the switch 118 or GFSG 218
639 determines whether the Service options require that the subscriber be prompted to
640 choose a caller profile (or no caller profile) to be delivered with the call. If the
641 Service options do not require the subscriber to be prompted, the method
642 continues in step 426.

643 However, if the Service options require the subscriber to be prompted, the
644 method continues in step 420, in which the switch 118 or GFSG 218 generates
645 announcements requesting user input. In step 422, the subscriber enters a
646 selection of a caller profile (or no profile) to be delivered with this call and the
647 switch 118 or GFSG 218 receives this selection. In step 424, the switch 118 or GFSG
648 218 informs the CPDS/SCP 110 or CPDS 210 of the option selected by the subscriber.
649 The method then continues in step 426.

650 In step 426, switch 118 or GFSG 218 extends the call to the called or
651 terminating switch 122 or GFSG 222. In step 428, the called or terminating switch

652 122 or GFSG 222 determines whether the called party subscribes to Caller-ID
653 service. If the calling party does subscribe, the method continues in step 430. If the
654 calling party does not subscribe, the method continues in step 442, in which
655 subsequent handling of the call follows normal call processing procedures.

656 In step 430, the called or terminating switch 122 or GFSG 222 queries the
657 CPDS/SCP 110 or CPDS 210 for the caller profile information for the call. In step
658 432, the CPDS/SCP 110 or CPDS 210 transmits the caller profile information to the
659 called or terminating switch 122 or GFSG 222. In step 434, the called or
660 terminating switch 122 or GFSG 222 determines the display capabilities of the
661 called subscriber terminal 124, 224. In step 436, the called or terminating switch
662 122 or GFSG 222 selects the appropriate caller profile information and transmits it
663 to the calling party. The selection step may include an evaluation of user-specified
664 policy options or rules defining conditions under which caller profiles will be
665 selected and transmitted, and this process may involve the cooperation of
666 CPDS/SCP 110 or CPDS 210. The method ends in step 438. During a call, the
667 method 410 could be activated by the subscriber, for example, by entering an
668 appropriate feature code or requesting a transaction via a WWW terminal, to
669 cause the caller profile to be delivered to the called subscriber terminal 124, 224 at
670 a time other than the beginning of a call.

671 Fig. 5 is a block diagram showing a method 500 for use with the preferred
672 embodiments 100, 200 of Figs. 1-2 for delivering caller profile information to a
673 called party when the caller is using a line, service, or handset to which the caller

674 does not subscribe, such as when visiting another location or borrowing another
675 subscriber's handset. The line, service, or handset which is to be used, and to which
676 the caller does not subscribe, is referred to herein as the "remote" line, service, or
677 handset. The service of delivering a caller profile to a called party when the calling
678 party is using a remote line, service, or handset, is referred to herein as the Remote
679 Caller Profile service. In order to use the Remote Caller Profile service, the
680 subscriber must first activate the service from the remote line or handset, for
681 example, using method 600 of Fig. 6 (discussed further below).

682 Method 500 begins in step 510 in which the subscriber dials the called
683 number from a remote line, service, or handset. In step 512, the switch or GFSG
684 from which the call is originated determines that the Remote Caller Profile service
685 has been activated for the remote line. In step 514, the switch launches a query to
686 CPDS/SCP 110 or CPDS 210 for information regarding Caller Profile Service options
687 governing the subscriber's caller profile. In step 516, the CPDS/SCP 110 or CPDS 210
688 returns the Caller Profile Service options. In step 518, the switch or GFSG
689 determines whether the Service options require that the subscriber be prompted to
690 choose a caller profile (or no caller profile) to be delivered with the call. If the
691 Service options do not require the subscriber to be prompted, the method
692 continues in step 526.

693 However, if the Service options require the subscriber to be prompted, the
694 method continues in step 520, in which the switch or GFSG generates
695 announcements requesting user input. In step 522, the subscriber enters a

696 selection of a caller profile (or no profile) to be delivered with this call and the
697 switch or GFSG receives this selection. In step 524, the switch or GFSG informs the
698 CPDS/SCP 110 or CPDS 210 of the option selected by the subscriber. The method
699 then continues in step 526.

700 In step 526, the switch or GFSG extends the call to the called or terminating
701 switch 122 or GFSG 222. Thereafter, the call may be processed in accord with steps
702 428-438 and 440 of Fig. 4. Accordingly, the method continues with step 428.

703 Fig. 6 is a block diagram showing a method 600 for use with the preferred
704 embodiments 100, 200 of Figs. 1-2 for activating the caller profile service in a
705 remote mode to enable delivery of caller profile information to a called party
706 when the caller is using a remote line, service, or handset to which the caller does
707 not subscribe. The method starts in step 610, in which the subscriber places a call
708 to the caller profile IVR system 114, 214 in order to administer the Remote Caller
709 Profile service. In accord with an aspect of the present invention, the Remote
710 Caller Profile service may alternatively be administered via an interactive data
711 session established between a subscriber terminal and the CPAS 112, 212. For
712 example, the CPAS 112, 212 may provide a World-Wide Web based interface for
713 administering the Remote Caller Profile service in a manner similar to the interface
714 described for administering the non-remote Caller Profile service. One of skill in
715 the art will understand how to modify step 610 and subsequent steps for operation
716 in the context of an alternate user interface.

717 In step 612, the IVR system prompts the subscriber to enter a user
718 identification code and password. If an alternate interface is used, the user is
719 prompted for a user identification code and password in a manner appropriate for
720 that interface. If a subscriber terminal capable of reliably identifying itself or the
721 subscriber (such as certain wireless handsets) is being used, the user authentication
722 steps may be avoided. In step 614, the subscriber enters the identification code
723 and password. In step 616, the IVR system transmits the user identification code
724 and password to CPDS/SCP 110 or CPDS 210. In step 618, the CPDS/SCP 110 or CPDS
725 210 determines whether the user identification code and password are valid. If the
726 user identification code and password are valid, the method continues in step 624.
727 However, if the user identification code and password are not valid, then the
728 method continues in step 620, in which the CPDS/SCP 110 or CPDS 210 informs the
729 IVR 114, 214 to play an announcement that the requested service will be denied. If
730 an alternate interface is being used for administration, elements of that interface
731 are instructed to report the service denial. Then the method ends in step 622.

732 If in step 618 the user identification and password were determined to be
733 valid, then in step 624, the CPDS/SCP 110 or CPDS 210 activates the Remote Caller
734 Profile service for the calling line, service, or handset. In step 626, the CPDS/SCP
735 110 or CPDS 210 instructs the switch serving the remote line, service, or handset to
736 activate the Remote Caller Profile service for the next call from the calling line,
737 service, or handset. In step 628, the CPDS/SCP 110 or CPDS 210 instructs the IVR

738 system 114, 214 (or alternate interface) to play an announcement (or provide
739 another indication) confirming activation of the Remote Caller Profile service.

740 In step 630, the IVR system 114, 214 (or alternate interface element) plays
741 the confirmation announcement (or otherwise displays an equivalent
742 confirmation). In step 632, the subscriber ends the call to the IVR system (or
743 otherwise concludes the administration session). The method ends in step 634.

744 The present application relates to telecommunications systems, including
745 multimedia telecommunications systems, which may be implemented using a
746 variety of electronic and optical technologies, including but not limited to: analog
747 electronic systems; digital electronic systems; microprocessors and other processing
748 elements; and software and other embodied collections of steps, instructions, and
749 the like, for implementing methods, processes, or policies in conjunction with such
750 systems and processing elements. The embodiments described herein are
751 exemplary. Thus it will be appreciated that although the embodiments are
752 described in terms of specific technologies, other equivalent technologies could be
753 used to implement systems in keeping with the spirit of the present invention.

754 The above-described embodiment of the invention is merely one example of
755 a way in which the invention may be carried out. Other ways may also be possible
756 and are within the scope of the following claims defining the invention.